

REMARKS/ARGUMENTS

In a Final Office Action mailed on July 14, 2003, the Examiner rejected pending claims 1-3, 5, 6, 13, 14 and 19 as being unpatentable under 35 § U.S.C. 103(a) over U.S. Patent No. 5,396,596 (issued Mar. 7, 1995; "Hashemi") in view of *A Study Of An SCI Switch Fabric*, IEEE 0-8186-7758 (Sept. 1997; "Liebhart"). The Examiner also rejected claim 4 under 35 § U.S.C. 103(a) as being unpatentable over Hashemi in view of Liebhart and further in view of U.S. Patent No. 6,571,310 (issued May 27, 2003; "Otteson"). The Examiner also rejected claims 8, 16 and 21 under 35 § U.S.C. 103(a) as being unpatentable over Hashemi in view of Liebhart and further in view of U.S. Patent No. 6,148,414 (issued Nov. 14, 2000; "Brown"). The Examiner objected to claims 3, 4, 6 and 19 for informalities. The Examiner also rejected claims 1, 14 and 19 under 35 U.S.C. § 112, second paragraph, for a term within the claims. Applicants respectfully traverse the Examiner's 35 § U.S.C. 103(a) rejections and request reconsideration and withdrawal of the rejections.

Objections

The Examiner objected to claims 3, 4, 6 and 19 for various informalities. In claims 3, 4 and 6, the Examiner stated that "back-end controllers" should be changed to back-end control elements to be consistent with previous citations. Applicants respectfully disagree with the Examiner. In claim 3, Applicants claim Back-End Control elements ("BECs") that *include* first and second pairs of back-end controllers. Claim 4 depends from claim 3 and correctly recites the back-end controllers of claim 3. Similarly, in claim 6, Applicants claim "BECs" that *include* first and second pairs of back-end controllers. Applicants have, however, amended claim 6 for editorial clarity. Applicants maintain that these claims are clear and definite. Regarding claim 19, Applicants has amended the claim in view of the Examiner's helpful suggestion. Applicants respectfully request reconsideration and withdrawal of the Examiner's objections.

35 U.S.C. § 112 Rejections

The Examiner rejected claims 1, 14 and 19 under 35 U.S.C. § 112, second paragraph, for a term rendering the claims indefinite. Applicants have amended claims 1, 14 and 19 for editorial clarity and to better protect the invention by deleting the word "substantially" in each of the claims. Applicants maintain claims 1, 14 and 19 are definite and, therefore, respectfully request reconsideration and withdrawal of the Examiner's § 112 rejection.

35 U.S.C. § 103 Rejections**Claims 1-10, 12 and 13**

Applicants essentially recite in claim 1, a storage system comprising a plurality of Front-End Control elements ("FECs") for controlling information exchange using RAID storage management with one or more attached host computer systems. The storage system also comprises a plurality of BECs for controlling information exchange with I/O devices. An interconnect element couples the FECs and the BECs such that they may exchange information with one another. Additionally the storage system is adapted to implement additional FECs, BECs and interconnect elements independently of all other such elements. The interconnect element is a Storage Area Network ("SAN") architecture fabric that conveys the requests from the FECs to the BECs. Neither Hashemi nor Liebhart teach or reasonably suggest, taken alone or in combination, an SAN architecture fabric, let alone one that conveys the requests from the FECs to the BECs.

Hashemi teaches channel interface modules ("CIM") and device interface module ("DIM") interconnected through an IEEE Futurebus Plus Interface (*see* Hashemi, column 3, lines 11-23). The Examiner correctly points out that Hashemi does not teach an SAN architecture fabric as the Applicants claims. The Examiner states, however, that Liebhart does teach an SAN architecture fabric and that the references are properly combined. Applicants respectfully disagree.

Assuming, *arguendo*, that the Examiner properly reads the recited FECs as Hashemi's CIMs and the recited BECs and Hashemi's DIMs, Liebhart does not teach or reasonably suggest a switching fabric for use in a storage system (i.e., an SAN fabric). The Examiner states that "Liebhart teaches the concept of using the Scalable Coherent Interface (SCI) switch fabric as a SAN interconnect system, allowing for communication across multiple nodes." Applicants strongly disagree with the Examiner's statement. Nowhere does Liebhart teach or reasonably suggest that the SCI switching fabric can be used as a Storage Area Network (SAN) fabric. SAN architecture, as applied to connect host systems to storage systems, is well known to those skilled in the art of storage systems. SCI is well known to those skilled in the art of parallel processing – but is not generally applicable to control and operation of storage systems. Such a distinction, therefore, is not one of terminology, but one of unique arts. Storage systems and parallel

processing architectures are not analogous areas of art except in the broadest sense that they are both computing related.

SCI is an Institute of Electrical and Electronics Engineers (“IEEE”) standard for computer-bus-like services. Instead of a bus, however, SCI uses a collection of fast point-to-point unidirectional links to provide the high speed throughput needed for high-performance *multiprocessor systems*. The intent of SCI is to support efficient data transfers among heterogeneous workstations within a distributed computing environment applying multiple parallel processors. *See generally*, <http://shop.ieee.org/store> for additional details regarding SCI. SCI pertains to multiprocessor systems within a distributed computing environment and Liebhart makes no reference to SCI applicability to storage systems. Similarly, Hashemi offers no suggestion that parallel processing architectures are applicable to storage system architectures for control and operation thereof. Hence there is no suggestion or motivation found in the art that would motivate one skilled in the storage system arts to combine Liebhart's parallel processing SCI teachings with Hashemi's storage system control architecture teachings.

To establish a *prima facie* case of obviousness, the Examiner must show some objective teaching in the prior art or in the knowledge generally available to one of ordinary skill in the art of *storage systems* that would lead an individual to combine the teachings of Liebhart with the teachings of Hashemi. *See In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596 (Fed. Cir. 1988). Since neither Hashemi nor Liebhart teach or reasonably suggest the use of a SAN fabric, the Examiner must be combining the two references in view of the teachings of the Applicants’ specification. The Examiner cannot use the Applicants’ specification to teach the proposed combination because such a use is impermissible hindsight. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986), *citing W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983).

The Examiner’s lone justification for combining the teachings of Liebhart and Hashemi is revealed in the Examiner’s statement that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Liebhart and Hashemi for the desirable purpose of system scalability and expansion as well as for providing a high speed, topology independent protocol.” Such a statement does not evidence a suggestion or motivation

found in the art for the specific modifications and combinations suggested by the Examiner as showing the use of SAN fabric within a storage system to couple front-end control elements with back-end control elements. Rather, the Examiner is stating that it would have been obvious to combine references simply because it makes a system better, faster or more scalable. These are qualities that are desirable in most any advance of the useful arts and accordingly do not show why someone would be *sufficiently* motivated to combine or modify the cited references. To maintain an obvious rejection, the Examiner must provide some convincing line of reasoning as to why it would have been obvious to one skilled in the art. *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat. App. & Inter. 1985). Examples of such reasoning can be the reliance on logic and sound scientific reasoning. However, the Examiner is reminded that even though one can reconstruct and/or explain the theoretical mechanism of an invention by means of logic and sound scientific reasoning does not afford the basis for an obviousness conclusion unless that logic and reasoning also supplies sufficient impetus to have led one of ordinary skill in the art to combine the teachings of the references to make the claimed invention. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). Applicants maintain that the Examiner has provided no such impetus and accordingly has failed to provide sufficient evidence supporting the Examiner's 35 U.S.C. § 103(a) rejection. The Examiner has failed to establish a *prima facie* case of obviousness. In the alternative, Applicants respectfully request reconsideration and withdrawal of the Examiner's § 103(a) rejection.

Applicants maintain independent claim 1 is novel and non-obvious in view of all prior art of record, either considered alone or in any combination, and is therefore allowable. Applicants respectfully request reconsideration and withdrawal of the Examiner's § 103(a) rejection. Furthermore, claims 2-10, 12 and 13 depend from allowable independent claim 1. Although the Examiner cited further references in the rejection of claims 4 and 8, claims 2-10, 12 and 13 are also maintained to be allowable for at least the same reasons as claim 1. Applicants respectfully request reconsideration and withdrawal of the Examiner's § 103(a) rejection of these claims as well.

Claims 14-18

Claim 14 essentially recites an FEC of a storage subsystem comprising a SAN interface for coupling the FEC through an SAN fabric to a plurality of BECs. Since Liebhart does not

teach or reasonably suggest a switching fabric for use in a storage system (i.e., an SAN fabric), Liebhart cannot be combined with Hashemi to sustain a rejection of the Applicants' claim under § 103(a). The arguments that applied to claim 1 apply herein as well, *mutatis mutandis*.

Applicants maintain that claim 14 is novel and non-obvious in view of the cited
5 references, either alone or in any combination, and is, therefore allowable. Applicants respectfully request reconsideration and withdrawal of the Examiner's § 103(a) rejection. Furthermore, claims 15-18 depend from allowable independent claim 14. Although the Examiner cited an additional prior art reference in rejecting claim 16, claims 15-18 are maintained to be allowable for at least the same reasons as claim 14. Applicants respectfully
10 requests reconsideration and withdrawal of the Examiner's § 103(a) rejection of these claims as well.

Claims 19-23

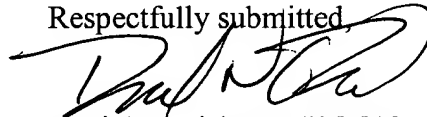
Claim 14 essentially recites a BEC for use in a storage subsystem comprising an SAN interface for coupling the BEC through an SAN fabric to a plurality of FECs. Since Liebhart
15 does not teach or reasonably suggest a switching fabric for use in a storage system (i.e., an SAN fabric), Liebhart cannot be combined with Hashemi to sustain a rejection of the Applicants' claim under § 103(a). The arguments that applied to claim 1 apply herein as well, *mutatis mutandis*.

Applicants maintain that claim 14 is novel and non-obvious in view of the cited
20 references, either alone or in any combination, and is, therefore allowable. Applicants respectfully request reconsideration and withdrawal of the Examiner's § 103(a) rejection. Furthermore, claims 20-23 depend from the allowable independent claim 19. Although the Examiner cited an additional prior art reference in the rejection of claim 21, claims 20-23 are maintained to be allowable for at least the same reasons as claim 19. Applicants respectfully
25 requests reconsideration and withdrawal of the Examiner's § 103(a) rejection of these claims as well.

CONCLUSION

Applicants have thoroughly discussed the Examiner's rejections of claims 1-10 and 12-23 in the Office Action mailed on July 14, 2003. Applicants have amended claims 1-3, 5, 6, 14, and 19 in response to the Examiner's §112 rejection and in response to the Examiner's objection to certain claims. Claims 1-10 and 12-23 remain pending in this application. Claim 11 was cancelled in a prior response. Applicants maintain the claims distinguish from the teachings of all prior art of record, either alone or in any combination. Applicants respectfully request reconsideration and withdrawal of all outstanding objections and rejections. If any additional fees are believed due, the Examiner is authorized to charge the Applicants' deposit account number. Should any issues remain, the Examiner is encouraged to telephone the undersigned attorney.

Respectfully submitted,



Daniel N. Fishman #35,512
Lathrop & Gage, L.C.
4845 Pearl East Circle, Suite 300
Boulder, CO 80301
(720) 931-3025
(720) 931-3001 (fax)